PROPERTIES OF THE NANOCONTACTS BETWEEN FERROMAGNETIC HALF-METAL ELECTRODES

J. Baszyński, T Toliński, W. Kowalski, A. Kowalczyk
Institute of Molecular Physics, PAS, Smoluchowskiego 17, 60-179 Poznań, Poland

9.7 cm

We report on the transport properties of nanocontacts based on the break-junctions of the $La_{0.7}Sr_{0.3}MnO_3$ ceramics at RT. Ferromagnetic perovskite manganites are good materials for testing the quantization effect of the conductivity because of their strong spin polarization. The value of the nanocontacts conductance G, for the predetermined voltage from the range 0.1 to 5 V depends critically on the local configuration of the Mn-ions magnetic moment just at the contact surfaces (Zener model). This configuration can be changed by the external magnetic field. The conductance is defined as $G = (e^2/h)N$, where N is the number of channels through the contact activated by the external magnetic field, or other words - pairs of the Mn-ions with parallel orientations of their magnetic moment. Then in the nearly parallel configuration of the magnetic moment of Mn-ions the electron can travel across the contact (low resistance state) but this is not so easy in the antiparallel configuration (high resistance).

13.4 cm

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Corresponding author :
J. Baszyński

Address for correspondence :
Institute of Molecular Physics, PAS
Smoluchowskiego 17, 60-179 Poznań
Poland

Email address :
jbasz@ifmpan.poznan.pl